Amendments to the Claims

1.   (currently amended) A method of predicting future locations of a moving object, comprising the steps of:

receiving a current location of the moving object;

obtaining a destination of the moving object;

computing a path along which the moving object travels from~~between~~ the current location to~~and~~ the destination; and

constructing a trajectory for predicting future locations of~~for~~ the moving object, wherein the trajectory approximates a time-based motion of the moving object along the path.

2.   (original) A computer readable medium having stored therein instructions for causing a central processing unit to execute the method of claim 1.

3.   (original) The method of claim 1, further comprising the step of:

sending the trajectory to the moving object.

4.   (original) The method of claim 1, further comprising the step of:

sending a map to the moving object.

5.   (currently amended) The method of claim 4, wherein the map includes~~contains~~ permissible travel segments for the moving object, and wherein the map further includes~~contains~~ an estimated travel time and a travel distance for each permissible travel segment.

6.   (original) The method of claim 1, further comprising the steps of:

receiving an updated location of the moving object;

recomputing the path based at least in part on the updated location and the destination;

and

constructing an updated trajectory for the moving object.

7.   (original) The method of claim 6, wherein the step of recomputing the path is also based

on an error.

8.   (original) The method of claim 6, wherein the step of recomputing the path is also based

on an error, and wherein the step of recomputing the path is performed when the error reaches a

threshold.

9.   (original) The method of claim 1, wherein the path represents the shortest distance

between the current location and the destination.

10.   (original) The method of claim 1, wherein the step of computing a path determines travel

times for possible paths and determines a fastest travel time.

11.   (original) The method of claim 1, wherein the step of computing a path is performed by

another computer system.

12. (original) The method of claim 1, wherein the step of computing a path further comprises:

sending the current location and the destination to a remote system; and

receiving the path from the remote system.

13. (original) The method of claim 1, further comprising the steps of:

receiving a traffic update;

adjusting at least one travel time in a map, wherein the adjustment is based on the traffic update, and wherein the map is used in computing the trajectory; and

recomputing the trajectory.

14. (original) The method of claim 13 wherein the step of adjusting at least one travel time is performed using a traffic incident duration model, and wherein the traffic incident duration model estimates the length of a traffic incident.

15. (original) The method of claim 1, further comprising the step of:

calculating a future location of the moving object, wherein the calculation is performed using the trajectory.

16. (original) The method of claim 1, wherein the current location is received from the moving object.

17.   (original) The method of claim 1, wherein the moving object is a cellular phone, and wherein the current location is received from a tracking authority.

18.   (currently amended) A method of determining trajectory of a moving device, comprising the steps of:

  obtaining a first location of the moving device;

  obtaining a destination of the moving device;

  computing a path between the first location and the destination, wherein the computation is performed using an electronic map that includes~~which contains~~ travel paths between points, and wherein the~~shortest~~ path is a sequence of travel paths; and

  simplifying the path to create a first trajectory <u>for predicting future locations of the moving device</u>.

19.   (original) A computer readable medium having stored therein instructions for causing a central processing unit to execute the method of claim 18.

20.   (original) The method of claim 18, wherein the step of simplifying the path is done using line simplification.

21.   (currently amended) The method of claim 18, wherein the step of simplifying the path is done by coalescing adjacent travel paths in the path that have the same travel speed and direction to create <u>the first trajectory</u>~~an estimated trajectory~~, and wherein the <u>first</u> trajectory is a compilation of line segments connecting the first location and the destination.

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22.   (currently amended) The method of claim 18, wherein the step of computing a path is performed by sending the first location and the destination to a remote device, and wherein the remote device computes the path and sends the path to a~~the~~ database.

23.   (original) The method of claim 18, further comprising the steps of:

receiving a second location of the moving device;

computing an updated path, wherein the updated path is based on the second location and the destination; and

calculating an updated trajectory, wherein the updated trajectory is based on the updated path.

24.   (original) The method of claim 18, further comprising the steps of:

associating an uncertainty with each line segment in the trajectory; and

calculating an overall uncertainty, wherein the overall uncertainty is based on the uncertainties for each line segment.

25.   (original) The method of claim 24, further comprising the steps of:

receiving a second location;

computing an updated shortest path, wherein the updated shortest path is based on the second location and the destination;

calculating an updated trajectory, wherein the updated trajectory is based on the updated shortest path;

associating an uncertainty with each line segment in the updated trajectory; and

calculating an overall uncertainty, wherein the overall uncertainty is based on the

uncertainties for each line segment in the updated trajectory.

26.   (original) The method of claim 18, further comprising the step of:

computing a future location of the moving device based on the trajectory.

27.   (original) The method of claim 18, further comprising the steps of:

receiving a traffic update;

computing an updated shortest path based on the traffic update; and

simplifying the updated shortest path to create a new trajectory.

28.   (original) The method of claim 27, wherein the step of computing an updated shortest

path is performed using a model to estimate a traffic incident duration.

29.   (currently amended) A method of using a trajectory to track locations of~~creating and~~

~~updating trajectory of~~ a moving device, comprising the steps of:

determining a first location of the moving device;

transmitting the first location of the moving device to a database;

receiving from the database a trajectory for ~~from the database~~computing anticipated

locations of the moving device at future points in time;

computing an anticipated location using~~based on~~ the trajectory;

determining a second location of the moving device; and

calculating a difference between the anticipated location and the second location.

30.   (original) A computer readable medium having stored therein instructions for causing a

central processing unit to execute the method of claim 29.

31.   (original) The method of claim 29, further comprising the step of:

transmitting the second location to the database, wherein the second location is

transmitted when the difference exceeds a threshold.

32.   (original) The method of claim 29, further comprising the step of:

determining a third location, wherein the third location is determined when the difference

exceeds a threshold; and

transmitting the third location to the database.

33.   (original) The method of claim 29, wherein the moving device is a cellular phone.

34.   (original) The method of claim 29, wherein the moving device is a personal digital

assistant.

35.   (original) The method of claim 29, wherein the moving device is a computer.

36.   (original) The method of claim 29, wherein the step of determining a first location and

determining a second location are performed using a global positioning system.

37.   (original) The method of claim 29, wherein the steps of determining a first location and determining a second location are performed manually by a user.

38.   (currently amended) A method of tracking locations of a moving device~~creating and~~ ~~updating a trajectory of a moving device~~, comprising the steps of:

    determining a first location of the moving device;

    transmitting the first location of the moving device to a database;

    computing a trajectory used for predicting anticipated locations of the moving device at future points in time;

    calculating an anticipated location based on the trajectory;

    determining a second location of the moving device; and

    calculating a difference between the anticipated location and the second location.

39.   (original) A computer readable medium having stored therein instructions for causing a central processing unit to execute the method of claim 38.

40.   (original) The method of claim 38, further comprising the step of:

    receiving a map from the database.

41.   (currently amended) The method of claim 38, wherein the step of computing a trajectory is performed using a map stored in the device, and wherein the map includes~~contains~~ travel distances and travel times for permissible travel paths.

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42. (original) The method of claim 38, further comprising the steps of:

determining a destination of the moving device;

transmitting first location and the destination to a remote system; and

receiving a path between the first location and the destination from the remote system.

43. (original) A method of tracking a moving device, comprising the steps of:

obtaining a first location and a first orientation of the moving device;

projecting a path for the moving object; and

computing a trajectory of the moving device.

44. (original) A computer readable medium having stored therein instructions for causing a central processing unit to execute the method of claim 43.

45. (original) The method of claim 43, wherein the step of projecting a path assumes the moving object will continue to travel on the same road segment at a speed until the moving object sends an updated location based on an error threshold.

46. (original) The method of claim 43, wherein the step of projecting a path assumes the moving object will continue to travel in the same direction until the moving object sends an updated location.

47. (original) The method of claim 43, further comprising the steps of:

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receiving a second location and a second orientation of the moving device;

projecting a second path for the moving object; and

computing an updated trajectory of the moving device.

48.   (original) The method of claim 47, wherein the step of projecting a second path uses dead reckoning on major roads.

49.   (original) The method of claim 47, wherein the step of projecting a second path uses periodic updates on minor roads.

50.   (original) A trajectory computation system, comprising:

a database server for receiving location information of a moving object, storing the location information of the moving object, and processing query requests;

a trajectory server for creating a trajectory of the moving object; and

a map server for storing travel paths between points, where each travel path has associated with it a distance and a travel time.

51.   (original) A system for anticipating the trajectory of a moving object, the system comprising:

an input client for receiving location data from the moving object;

an interface server for connecting with the input client; and

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an application server, where the application server is connected to the interface server, where the application server stores the location data, and where the application server computes an expected trajectory of the moving object; and

a map server, where the map server stores travel paths for a geographic region, where each travel path has with it an associated distance and time, and where the map server provides the travel paths to the application server for computation of the expected trajectory.

52.   (original) The system of claim 51, wherein the input client is a WWW client for receiving location data sent over the Internet.

53.   (original) The system of claim 51, wherein the input client is a PDA client for receiving location data sent from a personal digital assistant.

54.   (original) The system of claim 51, wherein the input client is a wireless client for receiving location data sent from a wireless communications device.